

OPERATING MANUAL
CATHODE RAY OSCILLOSCOPE
MODEL 536

Kikusui Electronics Corporation

Model 536 Cathode-Ray Oscilloscope

KIKUSUI ELECTRONICS Model 536 is general purpose oscilloscope designed for a compact, portable, and easy-to-use, employing a 3-inch cathode-ray tube and DC to 1.5 MC band-pass vertical amplifier.

Vertical amplifier has a stable, good phase characteristics wide-band push-pull DC amplifier, and horizontal employing wide-variable sweep oscillator.

It is so reliable oscilloscope that the equipment is fully used printed circuit and constructed in rational mechanism.

This model cabinet is available to standard 19 inch rack mounting with KIKUSUI ELECTRONICS Type 19-5 rack mounting frame.

Function of Controls and Terminals

- INT & POWER OFF

This knob is combined power switch and intensity control. Turning this knob clockwise from off position, Power is turned on. As this knob is further turned clockwise, intensity of the spot increases.
- FOCUS

This knob is to adjust the focus (sharpness of the trace).
- SYNC SELECT VARIABLE

 - LINE Synchronizing to power line frequency
 - INT - Synchronizing to negative going excursion of the observed wave forms.
 - INT + Synchronizing to positive going excursion of the observed wave form.
 - EXT Synchronizing to external signal applied to HOR INPUT terminal.

Internal knob (red) adjust the level of synchronizing signal.
- SWEEP FREQ VARIABLE

This is sweep frequency range switch of time-base oscillator, selecting range TV.H and from 10 cps to 100 kc. As turning fully this knob clockwise at "HOR AMP" position, time-base oscillator stops, and input of horizontal amplifier in connected to "EXT HOR" terminal on the panel.

Internal knob is for fine adjustment of sweep frequency.
- HOR GAIN

This knob is control the sensitivity of horizontal amplifier.
- EXT
SYNC
HOR

This terminal is used for 2-way input of external synchronization and input of horizontal amplifier.
- GND

This is connected to panel and chassis.
- VERT GAIN VARIABLE

The switch is voltage divider of vertical amplifier, having 1, 1/10 and 1/100 range. Turning this knob to CAL 1Vp-p or 0.2 Vp-p position, internal calibrated voltage connects to the amplifier and vertical input terminals is cutt off. Red internal knob is for fine control.
- VERT IN
GND

Input terminals for vertical amplifier.
- AC
DC

When this switch is on its AC position, the signal is applied to the vertical amplifier through a blocking capacitor. On its DC position, the signal is applied directly to the vertical amplifier.
- POSITION

These knobs are to move the position of spot or trace on the CRT screen vertically or horizontally.

- (DC BAL) This variable resistor compensates vertical moving of trace on the CRT when VERT GAIN VARIABLE knob (red colored) turn clockwise or counter clockwise.

- (INTEN MOD) The terminal located in the rear of cabinet, used as intensity modulation terminal with "GND" terminal on the front panel.

- (ASTIG) Located in the rear of cabinet, used as astigmatism control of CRT.

Operating Instruction

For long life expectancy and high reliability of your Model 536 Oscilloscope, it is recommended to be used under condition that line voltage keeps within $\pm 5\%$ of the rating. . . . Also it is not used under direct sunlight, in room temperature of over 40°C, or in high humidity circumstances.

Operation

The first, fix knobs of this equipment front panel as followings, Connect power cord to outlet of Power Supply.

INTEN	POWER OFF
FOCUS	medium
VERT GAIN	1/10 position
VARIABLE (red)	center
SYNC SELECT	INT+
VARIABLE (red)	turn fully to clockwise
SWEEP FREQ	range: 10-100
VARIABLE (red)	turn fully counter clockwise
POSITION	center
AC-DC slide-switch	switched to AC

Above arrangement is over, and

INTEN (power) turn on

Power is applied and the equipment attains operating condition after about 20 seconds of warm-up, and appears bright line on the CRT.

(abbreviation of cathode-ray tube) you find the bright line, adjust it with Knob of POSITION as becoming center position. And control the bright line to be fine using knob of FOCUS.

As knob of VERT GAIN switches to CAL 1Vp-p position, calibrated voltages in obtained on the screen of CRT, and adjust SWEEP FREQ (red) knob, stopped wave-form of calibrated voltage in observed. Calibrated voltages use line voltage.

In this state, you have primary experiences, about function control knob of SYNC SELECT and VERT GAIN (red).

9/17

Maintenance

Removal of cabinet

Put off the set-screws, one fixed in center portion of rear of cabinet other located in bottom of rear of cabinet and draws front-panel from the cabinet-case.

DC Balance adjustment

In case of moving vertically the spot with turning knob of "VERT GAIN" (red) at no signal. It shows that DC vertical amplifier is unbalance condition, required the alignment as following.

The equipment to be aligned should be operated for 30 minutes or more. It makes vacuum tube and other component steady state.

Adjust DC BAL variable resistor, as not moving the spot with turning knob of "VERT GAIN" (red).

DC balance alignment is need to change head tube V-101 of vertical amplifier, or parts around the head tube. (refer Fig.1).

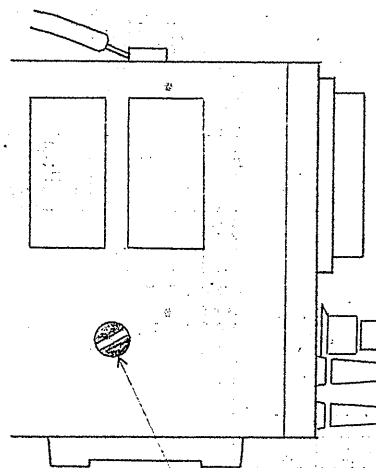


Fig. 1

Adjustment of astigmatism

This variable resistor is adjustor for astigmatism, to be aligned removing the winding from of line cord.

This adjust is required when changing CRT. (refer Fig. 2).

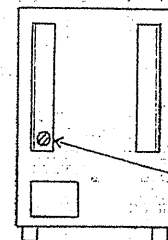


Fig. 2

Alignment of vertical dividers and input capacitances

In case of changing the parts used around the divider, this alignment is necessary. Removing the cabinet-case, high-quality square wave applied to the terminal "VERT IN" of this equipment.

Adjust the trimming capacitor as frequency compensator unless observed wave is as good as shown Fig.3 (refer Fig.4).

in adjustment of input capacitances, capacitance-meter connects to the terminal of "VERT IN", adjust the trimming capacitor in each range as capacitance meter indicating 30 pf.

The alignment should be began in order 1, 1/10, and 1/100. (Fig 5)

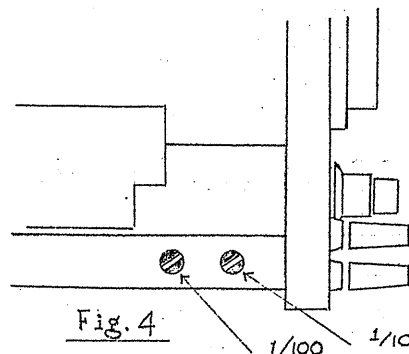


Fig. 4

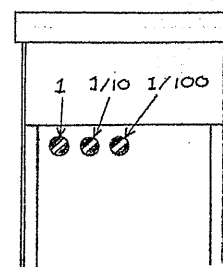


Fig. 5



Fig. 3